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ABSTRACT

To further test Charles Tiebout's suggestion that households reveal their preferences for public goods through their decisions to relocate, questionnaires were sent to the 2,290 people who bought homes in Charlotte (North Carolina) during 1977 and who were still living in the same house during the summer of 1981. Each of the 1,176 respondents rated the importance of commuting time (or distance) to work and public school attendance zones on their decision of where to live. Households with children ranked school attendance zones as more important than commuting time, the opposite of households without children. Further insight into the relationship between public schools and residential location is provided by a model derived from those 814 respondents who had previously lived in Charlotte. Using the 54 elementary school clusters within the city as the basic unit of analysis, the model utilizes variables of the third-grade reading achievement score and percent of nonwhite pupils, the neighborhood racial composition and average family income, and a distance from work factor. A household's ranking of school attendance zones as a location factor appears to be more highly correlated with the quality of education offered in the neighborhood public school than with the racial mix of students. (MLF)

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SCHOOL QUALITY AND INTRA-METROPOLITAN MOBILITY: A FURTHER TEST OF THE TIEBOUT HYPOTHESIS*

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G. Donald Jud

March 1982

(Revised December 1982)

* This study was funded by a grant from the N. C. Real Estate Research Center.

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I. Introduction

In 1956, in a now classic article, Charles Tiebout suggested that households reveal their preferences for public goods through their decisions to relocate. According to Tiebout, households with children who value quality public education are likely to be drawn to those locales where the quality of public schools is high. Alternatively, households without children may be influenced by preferences for other public services, such as, police protection, parks, etc. The Tiebout hypothesis has two basic facets. First, is the proposition that tastes for public goods differ among various segments of the population. Second, is the assertion that mobility decisions are affected by such taste differences. A clear corollary of the Tiebout hypothesis is that households with similar tastes for public goods will tend to cluster together in order to facilitate the joint purchase those public goods most desired.

Urban economists have reported considerable support for Tiebout's hypothesis from hedonic studies of housing values. The hedonic approach assumes that spatial variation in the supply of public goods among different locales is reflected in the price of housing. Studies by Kain and Quigley (1970), Harrison and Rubinfeld (1978), Li and Brown (1980), Jud and Watts (1981), and others have revealed that the quality of local public schools and other public services have significant, positive impacts on the price of housing.

The results of such hedonic price studies, however, relate only indirectly to the intra-metropolitan movement of population which is central to the Tiebout model. What is missing is direct evidence on the mobility of households as affected by differences in tastes for specific public goods, such as schools. One study which does offer such direct evidence has been reported by Charles Clotfelter (1975). His reserach indicates that the movement of white households is influenced by public school desegregation. In this

respect, Clotfelter's work supports the conclusions of the Coleman Report (1975). Other studies by William Frey (1979, 1980) have shown that the suburban relocation rates of whites are responsive to the city-suburban disparities in public expenditures for education.

This paper focuses on the intra-metropolitan mobility of households in response to differences in both the perceived quality of public schools and the racial mix of students. The study draws on a survey of 1,176 homebuyers in Charlotte, North Carolina. Section I provides evidence of systematic differences in preferences for public schools among Charlotte homebuyers. Section II presents estimates of a model of intra-metropolitan mobility. These estimates indicate that the perceived quality of public education is an important determinant of mobility but that the effect varies among different classes of homebuyers. This variation suggests a tendency for households with similar preferences to cluster together, as posited by Tiebout. A final section summarizes major findings.

II. Evidence of Taste Differences for Public Goods

The data for this research were obtained from a survey of 1,176 households in the City of Charlotte, North Carolina who purchased homes in 1977. The sample was restricted to the City of Charlotte in order to make it relatively homogeneous with regard to tax rates and the availability of major public services such as water and sewer. The sample was drawn from the 1978 Master Appraisal File obtained from the Tax Supervisor of Mecklenburg County, North Carolina. The 1978 Appraisal File listed 3,418 single-family residential properties sold in 1977. From this list, a check of the City Directory and other sources revealed that 2,290 of the buyers who bought homes in 1977 were still living in the same home during

TABLE 1

Importance of Location factors

	Mean Rankings of Location Factors		
	Commuting Time	Schools	X^2
Full Sample (N = 1,176)	3.094	2.854	97.49*
Households			
with children	3.140	3.457	55.18*
without children	3.012	1.796	44.92*
X^2	11.98	384.13*	--
Households with children (N = 749)			
in public school	3.140	3.652	44.44*
not in public school	3.140	2.802	83.73*
X^2	4.53	61.50*	--
Households with children (N = 749)			
white	3.091	3.425	66.02*
non-white	3.469	3.704	60.08*
X^2	17.66*	9.33	--

*Significant at the .01 level.

the summer of 1981. Some homebuyers had moved, while others had never lived on the property, having instead purchased it for investment purposes. Mail questionnaires were sent to each of these 2,290 households and follow-ups of non-respondents also were made by mail. Usable responses were obtained from 1,176 households--an overall response rate of 51 percent.[1]

Sample respondents were asked two questions intended to solicit information on their preferences for public schools and the effects of these preferences on their decision of where to live. Each respondent was asked to rate the importance of 1) commuting time (or distance) to work and 2) public school attendance zones in their decision of where to live. Responses were rated on a five-point Likert scale (on this scale responses ranged from 5 = extremely important to 1 = not at all important).[2]

Table 1 shows the mean rankings of the two location factors by all respondents and various subsample groups. Commuting time to work was ranked highest by all homebuyers.

When sample responses were tabulated separately for those households with children and those without, the ranking of school attendance zones was found to be significantly higher for those households with children. Households with children ranked school attendance zones on average as more important in their location decision than commuting time to work. Those households without children ranked school attendance zones significantly less important than commuting time.

Among households with children, there was a significant difference in the ranking of school attendance zones between those households with children in public school and those whose children attended private schools. As expected, households with children in public school ranked

public school attendance zones significantly more important than households with children in private school. Public school families ranked school attendance zones more important than commuting time, while non-public school households ranked attendance zones less important.

Racial differences in the rankings given school attendance zones among families with children were found to be relatively small. There were no significant differences between white and non-white families in their rankings of attendance zones. Non-white families ranked commuting time significantly higher than white households, but both groups ranked school attendance zones as significantly more important to their location decision than commuting time.

The results of this section suggest that the location effects of preferences for public education are significantly different between households with children and others. For households with children and especially in households where the children attend public school, interview data suggest that school attendance zones are a more important location factor than commuting time. These findings accord with Tiebout's basic hypothesis that preferences for public goods (in this case public education) affect household location.

In evaluating these results, it is worth noting that the Charlotte case provides a very rigorous test of the Tiebout model. This is because the Charlotte schools in the 1970s were under court-ordered desegregation, and school boundaries were reviewed and redrawn by the court about every three years. Any measure of the effect of public schools on residential location decisions obtained from this type of environment is likely to be less than if school assignments were more stable.

III. Evidence on Intra-Metropolitan Mobility

A simple model of intra-metropolitan mobility provides further insight into the relationship between public schools and residential location. The model can be written as follows:

$$(1) \quad N_1 = a + b_1 Q_i + b_2 R_i + b_3 B_i + b_4 Y_i + b_5 D_i + u_i$$

where,

N_i = the number in-migrant households into elementary school cluster i,

Q_i = average reading score of third graders in the school cluster,

R_i = percent of non-white students in the school cluster,

B_i = average percent of black residents in the census tract(s) served by the school cluster.

Y_i = average family income (1970) in the census tract(s) served by the school cluster (in $1,000's).

D_i = the average number of miles from the center of the census tract(s) served by the school cluster to the major employment centers of the Charlotte SMSA.

The elementary school pairing or cluster is the basic unit of analysis. In 1977, there were 54 such elementary school pairings or clusters within the City of Charlotte. The model focuses on the number of in-migrants into each of the clusters during 1977.[3] Data for the dependent variable were obtained from the homebuyer survey described in the previous section. Respondents were asked to list their previous address. Homebuyers who had not previously lived in Charlotte were dropped from the sample, so that the model relates directly to the determinants of intra-metropolitan mobility as discussed by Tiebout. Using the remaining 814 respondents, tabulations

were made to determine the number that bought homes in neighborhoods served by each of the 54 elementary school clusters. These subtotal calculations provided the data for the dependent variable (N_i). The sample recorded housing sales in 50 of the 54 school clusters. A table showing sample means and standard deviations is given in the Appendix.

Beginning with Rossi's (1955) classic study of the determinants of mobility, most researchers have viewed mobility as an adjustment by households to changes that for one reason or another have reduced the utility of the household's present location. That is, mobility is a response to a change in the household's demand for housing services.[4]

In this sense, equation (1) is a model of migrant neighborhood choice, rather than a formal model of mobility. The emphasis is not on explaining the changes in housing demand that are likely to lead households to move, but simply on describing the characteristics of neighborhoods that are likely to be selected by households that for one reason or another have decided to move. The basic hypothesis is that the pattern of neighborhood selection differs among households depending upon their preferences for public goods, in this case public education.

The model employs two variables that relate to the character for public education in the elementary school cluster: 1) the third-grade reading achievement score (Q_i) and 2) the percent of non-white pupils in the third grade of the school cluster (R_i). The reading achievement score measures the average grade-level performance on the state test of reading skills.

Both the quality and racial composition of local schools have received attention as determinants of residential location. Hedonic studies of housing values (see, for example, Kain and Quigley (1970), Harrison and Rubinfeld

(1978), and Li and Brown (1980) normally have used measures of student achievement or school inputs (i.e., expenditures per pupil, teacher-student ratios, etc.) as proxies for the quality of education. These studies generally have found that housing values are positively related to school quality and this, in turn, has been taken as evidence that housing demand and the potential number on in-migrants is higher in those locales where school quality is high.

The importance of the racial composition of public schools has been stressed in studies by James Coleman (1975) and by Charles Clotfelter (1975, 1979). This body of research indicates that desegregation of the public schools has been a significant cause of declining white enrollments and "white flight" out of urban areas. The Coleman thesis, however, has been the subject, of considerable debate. Rossell (1976) and Pettigrew and Green (1976) contend that residential mobility is responsive to other variables which, although correlated to school desegregation, have not been given adequate weight in the Coleman analysis. By introducing measures of both student performance and racial mix, equation (1) attempts to desentangle the independent effects of each of these variables.

The model also includes measures of the racial composition of the neighborhood and the average family income of neighborhood residents. Both of these variables are proxies for amenities of the neighborhood, such as, the quality of parks and playgrounds, maintenance of lawns and streets, etc. The racial variable is included also to measure the preference for segregated housing. Differences in the number of children per household between black and white families and in the fraction of children enrolled in private schools mean that the racial composition of the assigned public

TABLE 2

Intra-Urban Migration: Charlotte, 1977

	All Households		Households with Children		Households without Children	
	(2.1)	(2.2)	(2.3)	(2.4)	(2.5)	(2.6)
School Quality	11.596**	--	8.511**	--	3.838	--
	(1.92)		(2.02)		(1.20)	
Race	-23.826*	-38.310**	-9.391	-20.491**	-14.819**	-19.238**
	(-1.54)	(-2.75)	(-0.88)	(-2.17)	(-1.86)	(2.70)
Neighborhood Income	0.326	1.243**	0.442	1.091**	0.248	0.657
	(0.43)	(2.09)	(0.87)	(2.71)	(0.62)	(0.83)
Race	-18.748**	-19.943**	-9.164*	-9.916*	-0.137**	-0.129**
	(-1.91)	(-1.98)	(-1.39)	(-1.46)	(-2.00)	(-1.88)
Distance	-2.996**	-3.022**	-1.251*	-1.275*	-1.914**	-1.890**
	(-2.33)	(-2.28)	(-1.45)	(-1.43)	(-2.84)	(-2.80)
Intercept	21.717	58.628**	-3.459	24.185**	26.591**	38.119**
	(0.80)	(2.99)	(-0.18)	(1.82)	(1.91)	(10.17)
$\bar{R}^2$	0.384	0.347	0.379	0.334	0.314	0.298
N	50	50	48	48	45	45

Note: T-values are shown in parenthesis.
Superscripts indicate significance of coefficients (one-tailed test).

** $\geq$ .05

* $\geq$ .10

school cluster (R_i) will diverge from the racial mix of the neighborhood (B_i). Accordingly, while the coefficients of both these variables may be negative, their effects may be quite different. For instance, childless couples and singles might be quite unconcerned about the racial composition of the schools but very much influenced by the racial make-up of the neighborhood. Also, homebuyers may view the racial composition of the neighborhood as much more stable, because school attendance zones have been subject to frequent review and redefinition by the courts.

The measures of neighborhood income and racial composition were constructed from census sources (1970). Census tracts were mapped into the school assignment zones, and average income and neighborhood racial mix were calculated for each of the 54 school clusters. These variables were weighted averages. The total number of housing sales in 1977 within each tract in a school cluster was used as the weight for the that tract in constructing the cluster average.

The distance variable (D_i) was constructed in a similar way. First, the average distance from the center of each census tract to the largest employment centers of the Charlotte SMSA was determined using 1970 census employment data. Second, a weighted average distance for each tract was calculated using total employment weights. Finally, tracts were mapped into school clusters and an average distance for each cluster was determined, using the total number of housing sales within a tract to determine its weight in the cluster average.

Before discussing the regression estimates of equation (1), it is helpful to review the environment from which these estimates were taken. The City of Charlotte is the principal city in Mecklenbury County. A single,

consolidated public school system serves all of Mecklenburg County. The Charlotte public schools have been under court-ordered desegregation beginning with the 1970-71 school year. Public assignment plans have been reviewed by the court and major changes made during 1971-71, 1974-75, and 1978-79. Sample data for this study were drawn from 1977 housing sales. School assignment zones had been stable for almost three years prior to 1977.

Table 2 presents three estimates of basic model. In the first, the dependent variable relates to the total number of in-migrant households in each school cluster. In the second and third, it measures the number of in-migrant households with and without children, respectively.

Since the neighborhood income, race, and distance variables were weighted averages of census tract data (using the total number of housing sales as weights), sampling errors were likely to be larger in those school clusters with relatively few housing sales. To compensate, the regressions were weighed by the total number of sales in each cluster.[5]

All of the variables have the expected signs. The percent non-white in the neighborhood, distance, and the percent non-white in the school are negatively related to the number of in-migrants. Neighborhood income is positive, but insignificant in all the estimated equations when the school quality variable also is included. This may indicate that average income is not an adequate proxy for the level of neighborhood amentities.

The school quality variable is positive and significant in those regression equations which reflect the pattern of neighborhood selection by households with children, but not significant in the equation (2.5) describing the neighborhood choice of households without children. The omission of the school quality variable (columns 2.2, 2.4, and 2.6 in Table 2) results in a significant reduction in the percent of variance

explained by the equations for families with children, but not by the equation for families without children.

School racial composition is negative but insignificant in the equation (2.3) for parent households, when the school quality variable also is included. In the childless household equations (2.5 and 2.6), it is negative and significant regardless of whether the school quality variable also is in the equation. This may indicate that households without children tend to judge public schools more on the basis of racial composition and avoid neighborhoods where the percentage of blacks in the schools is high, regardless of school quality. Parent households, being more knowledgeable about school operations, may choose a neighborhood more on the basis of school quality and not solely based on the racial mix of students in the schools.

Such an interpretation, however, must be made subject to considerable caution. The simple correlation coefficient between school racial composition and school quality is high: in the all household sample (equations 2.1 and 2.2 in Table 2) it is -0.54. This colinearity between race and school quality indicates that the insignificant t-value on the school racial coefficient in Table 2 should not be interpreted as evidence that the racial composition of public schools has no effect on the location patterns of households with children. The results shown in Table 2 do strongly suggest, however, that leaving out school quality and focusing on race alone introduces a severe specification error into any model of intra-urban neighborhood choice. When the quality variable is not included, the absolute value of the estimated coefficients on school racial composition and the associated t-values rise. These results indicate that homebuyers in Charlotte are

TABLE 3

Elasticity Coefficients Calculated at the Mean
and Beta Coefficients*

	Q_i	R_i	B_i	Y_i	D_i
All Households	2.57 (0.37)	-0.52 (-0.23)	-0.14 (-0.23)	--	-2.22 (-0.28)
Households with Children	2.81 (0.41)	--	-0.10 (-0.17)	--	-1.37 (-0.18)
Households without Children	2.19 (0.27)	-0.89 (-0.32)	-0.16 (-0.28)	--	-3.64 (-0.40)

* Beta coefficients are shown in parenthesis. Only those coefficients with a t-value greater than one are reported.

concerned about the quality of public education when selecting a neighborhood and failure to control for differentials in school quality leads to an overestimate of the negative impact of student racial mix.

Because the dependent variables are different in each of the three sets of equations shown in Table 2, the magnitude of the regression coefficients cannot be used directly to assess to relative importance of independent variables. Table 3, which shows the elasticities of intra-urban in-migration with respect to each of the independent variables along with beta coefficients for each variable, was calculated to facilitate such an assessment. Both the calculated elasticities and the beta coefficients indicate that the intra-urban mobility pattern of households with children is more responsive to school quality differentials and less responsive to distance than is that of households without children.

Table 3, thus, provides additional support for Tiebout's hypothesis that preferences for public goods affect household location. As expected, the quality of public schools matters most to households with children. For this group school quality appears to be a more important determinant of mobility patterns than distance, or commuting time to work. The exact opposite seems to hold for households without children.

One final piece of evidence can be offered in support of the Tiebout hypothesis. Taking the entire sample of 814 intra-city movers, the Spearman rank correlation coefficient was calculated between each household's ranking of the importance of school attendance zones and the average quality (Q_i) of the school zone in which the household chose to locate. This coefficient was found to be 0.073, which was significant at the .05 level. The rank correlation coefficient of the household's ranking of attendance zones with the racial mix of students in the school

zone (R_i) in which the household located was -0.025. This coefficent was not statistically significant. By way of comparison, the rank correlation coefficient between the household's ranking of the importance of distance and the actual distance of the neighborhood (D_i) in which the household purchased a home was -0.148. The negative sign on this coefficient indicates that households which felt distance was an important location factor tended to purchase homes closer to the employment center.

These simple correlations are in harmony with the evidence previously presented in support of the Tiebout model: household preferences for public goods were found to accord with actual locational choice. Moreover, a household's ranking of school attendance zones as a location factor appears to be more highly correlated with the quality of education offered in the household's chosen neighborhood than with the racial mix of students in the neighborhood public school. Thus, these results further indicate the importance of school quality, and they correspond with the pattern of price effects on residential housing reported previously by Jud and Watts (1981).

IV. Conclusion

This paper has presented evidence which supports Tiebout's hypothesis. Preferences for public schools were found to be an important determinant of intra-metropolitan mobility. For families with children, interview data indicated that public schools were a more important location factor than commuting time. This result was supported in regression estimates of a model of intra-metropolitan neighborhood choice. Estimastes of this model also indicated that failure to control for school quality leads to a significant overestimate of the negative impact of school racial mix on neighborhood in-migration.

In the policy realm, the results of this study suggest that programs to upgrade the quality of urban public schools may be important in steming the flight of families with children out of urban areas. In the Charlotte case, the influence of school quality appears to be sufficiently independent of race to, at least, offer the hope that by creating better urban public schools citics can once again become an attractive place for all families to live.

The study also suggests why reports of the "back-to-the-city" movement most often indicate that the new, center city in-migrants tend to childless couples or unmarrieds. For this group, the results presented here indicate that distance to work is a much more important location factor than the quality of center city public schools, which may be so poor that households with children choose to locate in more distant suburbs.

The policy relevance of this work depends to a large extent on whether one believes that public administrators, through educational policy decisions, affect educational quality and student achievement, or whether achievement is simply a reflection of the socioeconomic class of entering students. Even a cursory examination of the educational literature reveals wide disagreement over precisely what school inputs affect student achievement and school quality. The Coleman report (1968) adopted the rather pessimistic view that the inputs to education have little effect once account is taken of the socioeconomic class of students. Summers and Wolfe (1977) reported evidence to the contrary: their study of Philadelphia schools showed that some school inputs have substantial effects on pupil performance. Until the issue is settled more concretely, my bias is to believe that good schools can make a difference.

Footnotes

[1] A comparison of respondents and nonrespondents revealed that those households responding to the survey tended to buy newer, more expensive homes, and homes more distant from the center of the city than did the nonrespondents. The degree of bias imparted to the findings reported here is difficult to access, but there is some reason for caution in any generalization of results.

[2] See C. William Emory (1976, pp. 248-50) for an explanation of this type of scaling technique.

[3] Greenwood (1975) has shown the information loss involved in models of net migration. Accordingly, the decision was made in this study to focus on the determinants of in-migration.

[4] For a recent survey and summary of the literature of intra-urban migration, see Quigley and Weinburg (1977).

[5] The variance of the error term was assumed to be $E(e_i^2) = 6^2/S_i^2$, where 6^2 is a constant and S_i is the total number of housing sales. In this case, weighting the observations in the regression equations by S_i yields an equation with constant variance. Comparison of the weighted and unweighted estimation results does not produce significant differences in the overall conclusions. In general, the $\bar{R}^2$'s and t-values in weighted regressions were somewhat higher, but the relative importance of the independent variables was not affected.

APPENDIX

Means and Standard Deviations of Variables

	N_i	Q_i	R_i	B_i	Y_i	D_i
All Households (N = 50)						
Mean	16.3	3.61	35.8	11.9	11.741	12.10
Standard Deviation	12.3	0.43	12.2	22.6	3.008	1.17
Households with Children (N = 48)						
Mean	11.0	3.63	36.3	11.9	11.818	12.07
Standard Deviation	7.8	0.40	12.2	23.0	3.024	1.19
Households without Children (N = 45)						
Mean	6.4	3.36	36.0	7.6	12.058	12.12
Standard Deviation	5.3	0.43	12.3	16.1	2.920	1.15

References

Clotfelter, Charles T., "Urban School Desegregation and Declines in White Enrollment: A Reexamination," Journal of Urban Economics 6 (July 1979), 352-70.

Clotfelter, Charles T., "Spatial Rearrangement and the Tiebout Hypothesis: The Case of School Desegregation," Southern Economic Journal 42 (October 1975), 263-71.

Coleman, James S., et al., Equality of Educational Opportunity (Washington, D.C.: Gov't. Printing Office, 1966).

Coleman, James S., Sara Kelly, and John Moore, "Recent Trends in School Integration 1968-73," (Washington, D.C.: Urban Institute Paper, 722-03-01, April 1975).

Emory, C. William, Business Research Methods, (Homewood, IL: Richard D. Irwin, Inc., 1976).

Frey, William H., "Central City White Flight: Racial and Non-Racial Causes," American Sociological Review 44 (June 1979), 425-48.

_____, Status Selective White Flight and Central City Population Change: A Comparative Analysis." Journal of Regional Science 20 (February 1980), 71-90.

Greenwood, Michael J., "Research on Internal Migration in the United States: A Survey," Journal of Economic Literature 13 (June 1975), 397-433.

Harrison, David and Daniel L. Rubinfeld, "Hedonic Housing Prices and the Demand for Clean Air," Journal of Environmental Economics and Management 5 (March 1978), 81-102.

Jud, G. Donald and James M. Watts, "Schools and Housing Values," Land Economics 57 (August 1981), 459-70.

Kain, John F. and John M. Quigley, "Measuring the Value of Housing Quality", Journal of the American Statistical Association 65 (June 1970), 532-46.

Li, Mingche M. and H. James Brown, "Micro-Neighborhood Externalities and Hedonic Housing Prices," Land Economics 56 (May 1980), 125-41.

Pettigrew, Thomas F. and Robert L. Green, "School Desegregation in Large Cities: A Critique of the Coleman 'White Flight' Thesis," Harvard Education Review 46 (February 1976), 1-53.

Quigley, John M. and Daniel H. Weinberg, "Intra-Urban Residential Mobility: A Review and Synthesis," International Regional Science Review 2 (Fall 1977), 41-66.

Rossell, Christine H., "School Desegregation and White Flight," Political Science Quarterly 90 (Winter 1975-76), 675-95.

References

Rossi, Peter H., Why Families Move (New York: The Free Press, 1955).

Summers, Anita A. and Barbara L. Wolfe, "Do Schools Make A Difference"," American Economic Review 64 (September 1977) 639-52.

Tiebout, Charles M., "A Pure Theory of Local Expenditures," Journal of Political Economy 64 (October 1956), 416-24.